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bars of the former hue or even chestnut in some examples. The tibioe are pale chestnut. Adult females are met with nearly as light-colored beneath as some third plumage males, and for a long time I was greatly perplexed by them — being reluctant to shoot specimens on account of their exceeding tameness.

The passage in Coues describing the adult female (op. cit., p. 547): "throat pure white but other underparts probably never whitening decidedly" led me to suppose that these might be males despite the fact that they were incubating. Having at length watched the mother of my tame hawks (which was of this light type) lay an egg, all my doubts were removed.

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## A SUCCESSFUL PAIR OF ROBINS.<sup>1</sup>

BY WINSOR M. TYLER, M. D.

THE following notes, taken for the most part while I had the birds under my eye, tell the story, as I saw it, of a pair of Robins (*Planesticus migratorius migratorius*) who successfully reared two broods of young from the same nest between April 26, 1912, when the nest was begun, and July 8, 1912, when the second brood was fledged.

I am sorry that I was able to watch the birds very little during the rearing of their first brood. After the completion of the nest, my notes give merely the dates of incubation, hatching and fledging. They make no reference to the feeding of the young and none to the disposal of excrement. I regret especially the latter omission, for, if we knew how generally the excrement was eaten early in the season, we might, by comparing the later behavior in this respect, get a hint of the extent that the excrement is used to satisfy hunger. In early July, when the female parent was feeding her second brood, her feathers showed much wear and she appeared emaciated. At this time, she almost invariably ate all the excrement that the

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<sup>1</sup> Read before the Nuttall Ornithological Club, Feb. 17, 1913.

young birds voided, during the time I had her under observation. My regret is that my notes do not show whether this habit was equally constant in May, when her general condition was good.

May 1st. At 5:30 A. M. yesterday and again at the same hour this morning, a rather bright colored Robin, but a female I have no doubt, worked for half an hour or more on a nest in the crotch of a locust tree opposite my side window, in Lexington, Mass. The nest is fifteen feet from the ground. Its base was originally white and was made of white strings. This morning she added straw and more strings. When she comes in with her bill loaded with the material, she adds it to the center of the nest, stands upon it and scratches with her feet. Then she settles and pressing down with her breast, turns around this way and that. The effect is to drive downward the newly added material into the fast forming cup of the nest and to loosen some of the strings on the edge. These loose ends she seizes in her bill and imbeds firmly in the sides of the nest, thereby building up the rim of the cup.

May 6th. The nest is nearly completed. Today a steady drizzling rain is falling from the southeast. The robin worked during luncheon time. Her method seems the same; — each time she arrives at the nest, she seats herself in it, scratches, and then presses the material downward. I believe that no mud was used in the construction of the nest.

Incubation began about May 12th.

The young birds hatched about May 26th.

June 7th. The young robins all leave the nest in the early morning. In the afternoon, there is pandemonium in the yard next door. A little girl is unwittingly playing near one of the young birds and the parents are distracted. As alarm notes, they use the sharp, high "Pleent" and the lower toned, nasal "hünt" They are not at rest for a second; they fly down over the child's head, nervously restive; they pump their tails, flit their wings, fly back and forth, always crying. A Chebec, a Purple Finch and a Warbling Vireo sing on, undisturbed.

June 8th. In spite of the excitement of yesterday, the female bird repairs the nest.

June 13th. Incubation begins.

June 23rd. The female bird, although she sits on the nest most

of the time, appears restless. She often picks something from the bottom of the nest or from its edge and eats it. It may be that the young are hatched, but I see no feeding.

June 25th. The young are hatched now. This morning their mouths appeared above the rim. Both parents feed; twice seen together at the nest. The female covers young after feeding and often prods about in the bottom of the nest in what appears to be a careless and dangerous way.

June 28th. Both parents again feed their young, meeting as before at the nest.

June 29th. Four young are fed often by female parent who each time, picks from the nest and swallows whole, big white sacs of excrement. Generally she finds two pieces. The food consists of earthworms and something green which may be the green worm, the favorite of the *Vermivora*. The female covers young for the night at 7:30,— a dark cloudy evening. I suspect that sometimes the male bird collects food and passes it to his mate who carries it to the nest for the young.

July 1st. The young birds this morning fill the nest level full. They are restless; they toss themselves about in the nest and make attempts, apparently, to preen their feathers. The female covers the young, as best she can, at 7:35 P. M.

July 2nd, 7:10 P. M. The female parent finds a worm on the lawn, and shakes it many times before flying directly to the nest and feeding the young. Now when the parent comes to the nest there is just the faintest sound from the young birds; a little ticking sound, audible only when I am very near.

The female feeds young, then stands still looking down into the nest with head slightly on one side. One nestling rises and passes a faecal sac directly into the bill of the parent, who stoops to receive it. At the next visit, this is repeated, but as two young void at the same time, the parent receives only one sac directly; the other she snaps up from the nest.

From the deliberate way in which a young bird tilts and then discharges the sac, it seems evident that he understands what his parent expects of him, when she stands at "attention" after feeding. From my room, thirty feet away, I can tell at once when the parent arrives at the nest by the "ticking" of the young birds.

July 4th. The young are feathering out fast. They rear up and flap their wings, in danger sometimes, it seems, of falling. Between the parent's visits, the young sink down into the nest. Their heads and necks, hanging limply over the edge, look like dead snakes. 7:20 P. M. The female arrives with beak empty. The young rear straight up, swaying drunkenly — she stands motionless — they sink down, then one, and later a second, young bird raises his rear and passes a faecal sac directly into the parent's beak. She, as always before, swallows both sacs. The young settle down at once. It is growing dark. The act of raising his hinder extremity to void faeces is apparently as conscious an action as rearing for food and it is likely that both are associated with the presence of the parent bird. 7:44. The female returns. The young rear, but, as she stands motionless, they subside. She snatches up a bit of excrement (I judge from her actions; it is too dark to see) and then settles on the rim of the nest, partly covering her young, probably for the night.

July 5th. Both parents feed the young in the morning. 7:15 P. M. The female parent visits the nest, perhaps feeds — the young strain up toward her making a sound like "si-si-si-si" etc. The old bird stares at them — one turns up, and quivers his quarter-inch tail — the parent snatches the sac. 7:30. The parent returns; she feeds her young little, if any; she eats three faecal packages. The young birds now flap their wings when they rear.

July 7th, 8:30 A. M. The young birds act very differently this morning. They are so large that when they move about they overflow the nest. One of the brood often stands on a branch of the crotch and moves back and forth between it and the nest, using his wings (flapping) as well as his legs. The parents stand off and "cluck" or "tut" to the young who answer with a very similar note — like the "quack" of a Catbird. When the venturesome young bird stands on the branch and the sac falls toward the ground, the parent dives for it. Both parents come about the nest, but stand off and call before feeding. When they bring food to the nest, the young give their former "sizzling" note. I notice for the first time the female parent leave the nest with a sac in her beak. 11:45. The young stand straight up on the nest edge when the parent comes near. In the interval between her visits, one squats

on the branch wholly out of the nest. The rest slump back into the cup and continually preen their feathers, scratch themselves, stretch their wings or restlessly plunge about. They now utter a loud exclamatory "kwut." The parent arrives. All four young stand up facing her, flapping their wings and "sizzling." She goes away and returns at once from the cherry tree with a whole fruit. She crams this down first one throat and then another, sometimes letting go of it for a second, sometimes retaining her hold. She pulls it out again and again. Finally a young bird swallows the cherry.

July 8th. Three of the young birds left the nest in the early morning. Great excitement in the family! The fourth remained in the nest all day. He was fed regularly, I think, and the nest was cleaned as usual. He may have flown in the evening, but the next morning the nest was empty.

The history of this pair of Robins illustrates the division of labor practised by this species in rearing their young (the male assuming the full charge of the first brood when they left the nest), and the nice economy of time by which without the loss of a single day, preparations for the second brood followed the fledging of the first (four fertilized eggs being laid within six days after the young had flown).

When I read these notes at a meeting of the Nuttall Club, Mr. Brewster said that while it was well known that adult Robins ate the excrement of their young, he believed that the behavior of this female bird was exceptional in that she fed upon the fæces to an unusual extent.

I should like to add a word on this subject; my notes might otherwise give the false impression that this Robin ate the fæcal sacs solely in the evening. It was mere chance that I wrote my notes chiefly at this time of day: at other hours, her behavior was the same.